TECHNICAL AUDIT REPORT Waste Management Audit



Submitted to

MANNAR THIRUMALAI NAICKER COLLEGE (AUTONOMOUS) MADURAI - 625 004, TAMIL NADU

Date of Audit: 24.08.2022

Submitted by





NATURE SCIENCE FOUNDATION

(A Unique Research and Development Centre for Society Improvement) [ISO Certified and Ministry of MSME Registered Organization] No. 2669, LIG-II, Gandhi Managar, Peelamedu Coimbatore 641 004, Tamil Nadu, India Phone: 0422 2510006, Mobile: 9566777255, 9566777258 Email: director@nsfonline.org.in

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1.WASTE MANAGEMENT AUDIT

1.1 Introduction

Waste management is a global environmental task but has always been neglected by the public. Improper waste management will create environmental issues viz., soil, water- and air-pollution which lead to health problems. Main reason for the polluted environment is unawareness of consumers and improper or poor legitimate initiatives. Ever increasing population rate and the improved life style of the people results in generation of an amplified amount of solid wastes, irrespective of urban and rural areas. Solid waste is defined as the unwanted substance which is generated by the society that does not have any economic value from the point of view of the user. Waste management is defined as the discipline associated with control of generation, storage, collection, transport/transfer, processing and disposal of solid waste materials in an aesthetic way.

There is a daunting need for effective waste management in India as 62 million tons of municipal solid waste and 38 billion liters of sewage is generated annually only from urban areas. The solid waste increases at the rate of 1.0 - 1.3% annually and the maximum amount of municipal waste is left untreated. Primary reason for unclean surroundings in the nation is unawareness of individuals, in general, deprived of institutional initiatives. While educating the environment about health and security, it has to be initiated from grass root level, primarily, educational institutions are the right forum to start with. Prior to teaching the students on waste management practices and preparing them to adopt a strategic plan of waste management to material management, educational institutions should establish the physical facilities and follow the fundamental guidelines. The physical facilities established in the higher educational institutions and their utility through onsite auditing and to assess the implemented waste management practices with particular reference to recycling and generation of value-added products.

1.2 Importance of Waste Management Audit

The Management (Auditee) should be exposed to their inherent commitment towards making an eco-friendly atmosphere through the waste management audit and ready to encourage all types of hygiene activities. It is necessary to conduct a waste management audit at regular interval (one year interval) because students and staff members should aware of the importance of hygiene and cleanliness of the campus and processes involved in the waste management audit which in turn help the institution to set a "bench- mark" (icon) to the community.

1.3 Benefits of Waste Management Audit

- 1.3.1 Find out various sources of organic and solid waste generation and mitigation measures
- 1.3.2 Documentation of the waste disposal system
- 1.3.3 Release of standing order report on waste management compliance1.3.4 Waste minimization opportunities realized that contributes to reduction in operating price
- 1.3.5 Increased worker cognizance of environmental standards and responsibilities.
- 1.3.6 Improve employee relations and morale.

1.4 Waste Management Plan of the Organization

Waste includes solid wastes, plant liters, biomedicals, electronic, kitchen organics and food wastes, plastic wastes, wastewater, effluents, hazardous waste materials, acids and chemicals. Waste Management Plan (WMP) provides guidelines and streamline the process of waste collection, separation, quantification, storage, transportation and disposal/recycling of wastes within the organization without harming the environment. Waste



management is one among the critical operating policies of the organization. Designed procedures are to assist a wide effort to safeguard the environment and to satisfy the laws/legislative policies and regulations regarding proper waste management.

Organizations should inspect waste management related facilities and activities which directly result in executing the scope and amendments of WMP. Guidelines for each and every step of waste management associated with organization may be undertaken. It should be taken into account while WMP is prepared and executed in the organization. It may be noted that abandoned materials and materials intended to be recycled are also considered as wastes. It is important to understand the above concept because even though something is going to be recycled, it must be managed until it is actually recycled. The wastes are categorized as hazardous and non- hazardous wastes depending upon the quantum of causing the adverse effect to the environment. Hazardous waste should be disposed properly by ignitability, reactivity, irritability and toxicity characteristics.

All recommended safety and handling procedures must be followed appropriately not only by the Management and concerned individuals also follow the norms. Waste production should be eliminated regularly and the material only for its planned purpose should be stored. Attempts should be made to curtail waste production, recycle the same and then properly dispose of it. All hazardous waste shall be segregated individually as well as non-hazardous wastes at the point of its generation. For the collection of waste, containers can be used and must be properly and clearly labelled. Also, if the waste is hazardous, it should be clearly labelled on the container along with its hazardous characteristics. Containers with color coding for easy identification should be kept to collect and segregate common wastes across the campus and at all the facilities while organic food waste shall be collected in separate containers.

1.4.1 Waste Management Policy

Under this subhead, the following criteria are primarily considered while formulating the waste management policy. The campus has adequate number of waste bins and separate bins for dry and wet wastes. It is also important to consider quantum of food wastes and its disposal methods. Proper protocol should be laid out for the methods adopted for waste collection, segregation, storage and disposal besides the reuse/recycling (production of organic manures and/or biogas) process methods. Establishment of incinerators for solid wastes and facilities available to upgrade the campus as 'Plastic free zone'.

1.4.2 Waste Management Initiatives

Waste management initiatives revolved around keeping sign boards indicating "Waste disposal pit", keeping adequate number of waste bins with color codes, awareness sign boards as "Tobacco free zone" and to create awareness among the stakeholders, installation of sign boards "Plastic free campus" and the routine activities related to waste collection, segregation, storage and disposal units. The Management should allot the work to concerned representatives/staff members however, each and every individual should adhere to the initiatives and policies implemented by the Management.

1.4.3 Sanitation and Hygiene Policy

Under this component, the following aspects are being considered where adequate water requirements, waste water recycling, water supply system, adequacy and efficiency of sanitation, plumbing, adequate clean drinking water facilities, hygiene of kitchen staff, hygiene of canteen, hostel and entire ambiance of the campus besides the adequacy of toilets and its hygiene.

1.5 Target Areas of Waste Management Audit

Target areas of waste management audit are a) wastewater management, b) solid waste management, c) entire ambiance of the campus, d) e-waste management, d) hazardous waste management, f) construction and demolition waste management and g) auditing the stakeholders for their contribution and environmental education besides implementing Swachh Bharath Abhiyan Scheme.

1.6 Aims and Objectives of Waste Management Audit

Primary objective of waste management audit is to safeguard the environment in terms of sustenance of environment in compliance with the appropriate valid rules, regulations and requirements. Waste management audit programmes conventionally designed and implemented judiciously which can boost the sustainable healthier environment of an organization which in turn monitor the optimum utilization of the resources. Primary objective of waste management audit revolve around,

- 1.6.1 Review the disposal of solid- and liquid-waste within the campus and ascertain the sources of waste generation and to mitigate with possible solutions in relation to environmental compliance
- 1.6.2 To take steps to minimize the environmental pollution and degradation by means of developing 'Sanitation and hygiene policy', and 'Waste management policy', by the Organization.
- 1.6.3 In accordance with legislative compliances, to adopt measures to reduce waste generation and recycling the both.
- 1.6.4 Establishing plastic free campus/zone with the help of management and to evolve health consciousness among the stakeholders.
- 1.6.5 In order to classify the solid and hazardous wastes, their source of generation, quantities and characteristics with respect to prevent environmental hazards.
- 1.6.6 To conduct outreach programmes on environmental damage and conservation.

1.7 Methods of Disposal of Wastes

Recycling and reuse methods may be adopted to minimize the quantity of wastes that are generated from the organization requiring proper ways of disposal. Quite a few waste materials can be reused within the campus while others can be recycled only in the specific sites. The recycling of used oils, acids, solvents and chemicals is possiblein some of the laboratories; plastics and ewastes including batteries may be revert back to manufacturer/authorized dealers/distributor while

Coding system for	or different type of waste
Waste material	(Colour or code)
Glass	(blue); 🔳
Metals	(green); 💻
Plastic	(white); 💻
Oily rags	(black); 🔳
Used oil	(red); 🔳
Rubbish / trash	(yellow) 🗖

it should not be sold to the unauthorized contractors / companies who may not have proper recycling facilities and to avoid misuse or to reduce associated liabilities.

1.7.1 Onsite Disposal Facilities

Burial pits may be created in which waste should be buried and covered with soil sufficiently as 'daily cover' to reduce the environmental issues like unpleasant odour from decaying / degrading waste, spreading of waste into nearby areas in response to wind blowing and to avoid vermin and disease spreading vectors, flies, mosquitoes, etc.

1.7.2 Reserve Pits

Reserve pits are used temporarily to store drilling waste, chemical waste, oily sludge and contaminated soil. These pits should be appropriately designed and furrowed to eradicate soil-, ground-/surface-water contamination.

1.7.3 Incineration

Incineration is another type of waste disposal wherein an incinerator is used. Prior to burning, items that are not to be burned should be segregated and incinerated ash shall be buried in the lined landfill as it may contain heavy metals

1.7.4 Evaporation Ponds

Evaporation ponds are used to eradicate the produced water at some facilities. It may be noted that all evaporation ponds should be lined properly.

1.8 Steps Involved in the Process of Waste Management Audit

It is a customary stepwise process where it starts with an opening meeting among the audit team and auditees/Management Representatives and is completed with exit meeting. Flow chart for the same presented earlier in the Green Audit section is applicable here again. However, any specific parameter that comes under this section will be highlighted hereunder.

- 1.8.1 During onsite audit it has been monitored and documented the components as per the waste management audit checklist.
- 1.8.2 Identify the issues in the campus with respect to waste management compliance and merits/ weakness beside the risks associated with waste management.
- 1.8.3 Collect information about Ecology and Environment studies, awareness programmes conducted and publications with respect to hygiene

1.8.4 Comparison between the previous audit report and internal quality report with the current audit findings in which the number of suggestions and recommendations were adopted by management should be indicated.

1.9 Qualitative and Quantitative Measures of Waste Management Audit

The qualitative and quantitative measurements includes achievement of waste management objectives and targets by implementing agency, appointment of concerned staff working for waste management, waste management methods, hazardous and toxic material disposal facility, solid waste management facility, incinerator facility, housekeeping, sign boards indicating "plastic free campus", "tobacco free campus", "don't waste water", etc.

1.9.1 Qualitative Measurements of Waste Management Audit

As per the internal waste management audit protocol, Management has developed procedures for implementation and continuous monitoring of certain mandatory parameters. In order to monitor and regularize the day to day routine within the campus, pertinent staff or group of members assigned duties with respect to waste management audit. It has been found that during an onsite audit, the Organization has created a wastewater treatment plant and solid waste management facility in compliance with National Building Code (NBC). Appreciable amount of dedicated work has been diverted towards disposal of hazardous and toxic materials in the campus. Well established composting pits and vermicompost pits are available within the campus in order to convert the wastes to value added products like organic manures. Availability of incinerators for napkin disposal was established in the campus. For creating awareness among the stakeholders, signboards indicating plastic free zone, tobacco free campus, don't waste water, etc., were fixed at appropriate places besides dust bins with proper labelling and ecofriendly trash kept across the campus to provide a pollutant free atmosphere.

Organization is conducting sustainability courses to the stakeholders, signing MoU with Government and NGO's to ensure ecofriendly campus maintenance and studies and conduct the awareness programme for the benefit of stakeholders through Nature club, Eco club, NCC, NSS, etc. Furthermore, it is encouraging to note that the waste disposal practices adopted in the campus is followed systematically. Steps taken for segregation of organic and inorganic wastes, e-waste, biomedical waste and construction and demolished waste were collected individually, segregated, transported and disposed/recycled according to the said norms without affecting the environmental degradation.

S.	Part 11 clause	Audit Checklist / Parameters	Audit
No.	as per the		Findings
	National		(C / NC/
	Building Code		PC)
1.	10.6.5.	Whether the biomedical, e-waste and plastic	С
	Provision for	Wastes are collected, segregated and	
	waste requiring	disposed separately?	
2.	special	Whether the chemical and toxic materials are	С
	management	disposed of properly?	

Table 1. Qualitative Measurements

10.6.3 Liquid &	Whether the solid waste is collected, segregated	С
Solid waste	and disposed separately?	
system planning	Maintaining different coloured dustbins to	С
	segregate the organic and inorganic wastes.	
	Recycling activities of solid waste by composting /	С
	manuring methods	
	Whether the personal protected materials like	С
	Gloves, Caps, Masks, Aprons & Gum boots etc.	
	are used adequately?	
	Are the wastes transported in closed containers or	С
	open bags? and are the waste collection	
	bins/Trolleys/wheelbarrow used for transporting	
	wastes?	
	Whether construction, demolition and wood	С
	wastes are subjected to reuse?	
	Whether plastic wastes are burnt inside the	С
	campus? Any air pollution due to plastic materials	
	burning takes place?	
	Whether acids, solvents and salts are properly	С
	discarded after diluting with water?	
	10.6.3 Liquid & Solid waste system planning	10.6.3 Liquid & Solid wasteWhether the solid waste is collected, segregated and disposed separately?system planningMaintaining different coloured dustbins to segregate the organic and inorganic wastes.Recycling activities of solid waste by composting / manuring methodsWhether the personal protected materials like Gloves, Caps, Masks, Aprons & Gum boots etc. are used adequately?Are the wastes transported in closed containers or

1.9.2 Quantitative Measures of Waste Management Audit

With particular reference to quantitative measures of waste management practices within the campus, the Management has established one unit of wastewater treatment facility. Identically, for the purpose of solid waste management treatment/recycling, the Management has established 2 units of compost bins and paper, plastic, metal, e-waste, hazardous waste facilities. It is also noted that the Organization has a provision for recycling the kitchen wastes and plant leaf litter degradation; for this purpose, the campus has two compost bins and one compost pit. Of course, the Organization has implemented the Government schemes such as Swachh Barath Abhiyan under Clean India Mission and effectively conducted the programmes.

1.9.3 Waste Disposal and Tracking Form

It has been observed that the audited Organisation followed & maintained the waste disposal and tracking form for documentation. Specimen copy of the tracking form is presented hereunder wherein they documented the following parameters a) waste types, b) quantum of waste disposed, c) whether it is onsite/offsite disposal and authorized company responsible for recycling. It has been found that most of the wastes were disposed of through Corporation facilities while agricultural waste is being recycled within the campus and utilized for composting purposes. Furniture wastes are disposed of through SEZ. Napkins were disposed through incinerators while sewage sludge is recycled using STP.

S.No.	Types of Waste	Approximate Quantity / Unit Disposed	Disposal Location (On- site / Off-site)	Authorized Company responsible for recycling
1.	Acids and Bases			-
2.	Aerosol Cans			
3.	Agriculture Waste	Compost pit	On-site	In house
4.	Aluminium, Metal Cans, Tins			
5.	Asbestos			
6.	Batteries (Dry)	2 Battery banks	On-site	Buy back to suppliers
7.	Batteries (Lead			
8.	Biomedical Waste			
9.	Car exhaust			
10.	Charcoal			
11.	Clinical Waste			
12.	Cloth Materials			
	Waste			
13.	Construction	10% of the	Off-site	College
	waste	I otal Material		
14.	Condensate Waste			
15.	Crude Oil			
16.	Descaling Acids			
17.	Drilling Fluids/ Solids			
18.	Drumsand			
	Containers (Empty)			
19.	Effluents from			
	major equipment			
20.	Electrical Waste			
	(Wires, Switches,			
	Fans, A/C			
	Meters Coils etc.)			
21.	Electronic Waste	2410kg	Off-site	Local Disposal shops
	(Computer, Laptop,			
	CD, Pen drive,			
	Keyboards, Mouse,			
	Printers,			
22.	Fertilizer Waste			
23	Filters			
24.	Fluorescent Light			

Table 2. Details of Waste Disposal and Tracking Form

25.	Food Waste			
26.	Furniture Items	100kg	Off-site	Local Disposal shops
27.	Garbage and			
28.	Glass Bottles	10 bottles		Recycled for Ornamental plants
29.	Glassware items Waste	10 bottles		Recycled for Ornamental plants
30.	Glycols			
31.	Hazardous Waste			
32.	Household items			
33.	Human Waste			
34.	Inert Waste			
35.	Laboratory Wastes	Few kgs	Off-site	Local Disposal shops
36.	Lights and Bulbs	Few kgs	Off-site	Local Disposal shops
37.	Kitchen Waste			
38.	Metal Waste	Few kgs	Off-site	Local Disposal shops
39.	Napkins	20/day	On-site	Incinerator
40.	Oil Contaminated Soil			
41.	Oily Sludge & Rags (Used)			
42.	Packaging Waste	Few kgs	Off-site	Corporation
43.	Paint Waste			
44.	Paper Waste	Few kgs	Off-site	Local Disposal shops
45.	Pathological Wastes			
46.	Pigging Wastes			
47.	Plant Wastewater	5000 lit/day	On-site	Wetting of roads
48.	Plastic Waste			
49	Plasticware items waste			
50.	Produced Water Waste			
51.	Radioactive Waste			
52.	Rinsate Waste			
53.	Rubber Waste			
54.	Salts used in Laboratories (Used & Expiry Chemicals)	50 litres per month (Liquid waste)	On-site	Following the standard operating procedures
55.	Sanitary Wastewater			

56.	Scale (Pipe and	Once in a year	Onsite	Drainage
	Equipment)			
57.	Sewage Sludge			
58.	Solvents			
59.	Sludge and allied			
60.	Trash			
	(i) Glass			
	(ii) Metal			
	(iii) Plastic			
	(iv) Oils			
	(v) General Trash			
61.	Synthetic Dyes,			
	other items			
62.	Textile Waste			
63.	Used Engine Oil	Few	Off-site	In Gaurages
64.	Wastewaters (Liquid			
	Waste: Detergents,			
	Soap, Oil, etc)			
65.	Wood Waste	Few	Off-site	Local Disposal shops

1.10 Observations of the Waste Management Audit1.10.1 Plastics Use and Their Impact on the Environment

The Ministry of Environment, Forest and Climate Change, Government of India has advised the Plastic Waste Management Rules, 2016. A Central Pollution Control Board report specified that the total annual plastic waste generation is quite huge and accounts around 3.3 million metric tonnes/year for which the data were collected from 60 major cities in India. The country generates around 26,000 tonnes of plastic waste/day out of which 60% of plastic produced is recycled. It doesn't degradable, rot, like paper or organic waste like food and



hence, it can hang around in the environment for hundreds of years. More than eight million tonnes of plastic escapes from the land cover and enters the world's oceans each year while only 9% of the total plastic waste in the world is recycled. It is observed that 96% of plastic wastes are collected and segregated by the respective urban bodies in which the recyclable plastic waste is sold to the recyclers and non-recyclable plastic waste are sent for co-incineration in cement plants.

People should be probed to use reusable substances and initiate models which allow up-cycling of waste for better use. This will help to reduce plastic waste from urban local bodies, as well as curb the value for waste among the citizens. Plastic waste management is very important, because plastic is not only pollute the environment, it destroys food chains.



People should be probed to use reusable substances and initiate models which allow up-cycling of waste for better use. This will help to reduce plastic waste from urban local bodies, as well as curb the value for waste among the citizens. Plastic waste management is very important, because plastic is not only pollute the environment, it destroys food chains. People use plastic bags and plastic ware every day to hold objects like meals, clothes, grocery and stationary items which can be bought from shops. Generally, the plastic items are non degradable in nature that led to soil pollution and affect the soil health significantly. Most of the plastic items are considered as solid waste and enhance the unwanted animal choking, water pollution, blockage of channels, rivers and streams and landscape disfigurement.

According to the World Health Organization (WHO) report, plastic items take at least 400 years to decompose completely in the soil which illustrates the subsequent effects on the environment. Plastic pollutants form a basis for damage to the healthier environment besides the living organisms in the ecosystem. It impacts all organisms in the food chain from tiny species to big ones. And hence, reduction of plastic usage is the need of the hour to protect at least the present-day natural resources. There is a need to reduce the plastic use to effectively limit plastic waste in the campus.

Organization has taken sufficient attempts not to use plastics in the campus and displayed a slogan 'say no to plastics' in the campus like canteen, hostel dining halls, seminar halls, corridors, etc. to the students, parents and public. The Management insisted the people to use eco-friendly bags made from organic materials like plant fibers which are easily decomposable in nature. These efforts are very much essential to keep the environment neat and clean to conserve nature.

1.10.2 Solid Waste Management Practices at the Campus

The term solid waste control refers to the method of accumulating and treating solid wastes by following eco friendly methods. It also offers solutions for recycling objects that do not belong to garbage. In solid waste management, the wastes are accumulated from different parts and are disposed of based on degradability materials like paper and non- degradability materials like glasses, plastics and metals. Integrated solid waste management is an activity that promotes reduction of waste, recycling, composting and disposal besides offering methods/solutions to manage stable wastes in the context of protecting all living organisms in the ecosystem.

As per Solid Waste Management Rules, 2016 (Ministry of Environment, Forest and Climate Change, Government of India), solid waste refers to solid or semi-solid wastes generated from domestic, commercial, institutional, catering and markets and other non-residential wastes (street sweepings, silt removed or collected from surface drains, horticulture/agriculture and dairy waste, biomedical waste excluding industrial waste, and e-waste, battery/radio-active waste). According to the rules, the local authorities are responsible to collect, treat and dispose of the solid wastes. The 'Central Board of Solid Waste Management' is the monitoring authority and is responsible for granting authorization to local bodies for processing and disposal of solid waste. Organization has a very good solid waste recycling unit which operates a few vehicles to collect wastes using compostable bags across the campus. Both degradable and non- degradable items are being collected from canteens, stationary shop and hostels every day and disposed of through Corporation facility.



Waste Management in Mannar Thirumalai Naicker College, Madurai

1.10.3 Waste Management Practices

Waste Management has a common mandate that the "Producer Owns the Responsibility". The community that generates waste should develop more responsibility in handling the waste with more care thus reducing negative impact on the environment. In a study conducted in 2013 by 'M/S Hand in Hand India Ltd.' In the Campus it had quantified a daily average of wastes in which food waste is about 37%, recyclable waste is about 27% and other organic waste is about 36%. The study revealed that the solid wastes need to be professionally handled.

The solid wastes are collected from different places of campus and segregated based on biodegradable and non-degradable materials subsequently subjected for recycling and degradation processes like composting. Details of the waste management practices in the Organization are 1) biodegradable waste handling, 2) sewage treatment plant and 3) disposal of e- waste.

1.10.4 Bio-degradable and Non-degradable Waste Materials Management Practice

For segregation of waste (Organic, recyclable, non-recyclable and e-waste) at source and collecting the same 'Waste Bins' are placed at designated locations in the Campus viz. Students Hostels and Staff rooms, Students Service Centre, Sports Complex and Guest rooms. A Contractor is engaged for the collection and further process of waste generated within the campus where biodegradable wastes subjected to preparation of organic compost.

1.10.5 Disposal of E-Waste

According to E-Waste Management Rules, 2016 (Ministry of Environment, Forest and Climate Change, Government of India), electronic waste or e-waste includes old and non-functional electrical and electronic appliances (telephones, cellular telephones, computers, laptops, television sets, refrigerators, washing machines, air- conditioners, fluorescent and other mercury containing lamps etc.). As per the Rules, the producer of the electrical and electronic equipment shall be responsible to collect and channelize the e-wastes generated under the criteria Extended Producer Responsibility. E-waste Management Rules applicable not only to Manufacturer/Producer, it is also applicable to Consumers, Collection Centre/Dealer, Retailer, Dismantler and Recycler. In compliance with the E-Waste Management Rules, 2016, Government of India, e-waste materials collected from the Organization are being segregated and then sold to Authorized Agencies which are approved by the Pollution Control Board (PCB) for handling e-waste. Due to this ewaste activity disposal, the e-waste pollution is significantly reduced in the Campus. However, a proper method of e-waste disposal should be done in coming years in collaboration with Tamil Nadu State Pollution Control Board as per the E-Waste Management Rules, 2016. Organization has produced lesser quantity of e-waste and the same has been disposed thro' Corporation facilities.

1.10.6 Construction & Demolition Waste Management

The Ministry of Environment, Forest and Climate Change, Government of India has notified the Construction and Demolition Waste Management Rules, 2016 exclusively to manage waste (building materials, debris and rubble) from construction activities like new construction, re-modelling, repair and demolition. According to the Rules, the local authorities need to ensure proper management of construction and demolition wastes. The State Pollution Control Board is to grant authorization for the waste processing facility and to monitor the implementation of these Rules. One of the best waste management practices is rebuilding construction waste into pillars, pathway roads. The construction waste inside the campus is found to be very low.

1.10.7 Hazardous Waste Management

According to the hazardous waste (Management and Trans Boundary Movement) Rules 2016 (The Ministry of Environment, Forest and Climate Change, Government of India) under Environment (Protection) Act, 1986 Hazardous waste refers to "any waste which by reason of characteristics such as physical, chemical, biological, reactive, toxic, flammable, explosive or corrosive, causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances". Hazardous waste generators shall follow various steps (minimizing the utility of hazardous elements, prevention, recovery, reuse by coprocessing, recycling, and safe disposal) of hazardous waste. The State Board of 'Hazardous Waste Management' is taking operative steps in handling and management of hazardous wastes, its treatment and disposal in an environmentally safe manner. The Organization should have taken pioneering efforts to dispose of the hazardous waste properly that are generated from various Department laboratories. Acids, solvents, salts, reagents and cancer-causing substances (carcinogens) will cause cancer to the stakeholders who are doing research and/or experiments. Most chemical wastes must be disposed of safely without affecting the environment, soil health and water quality as per the directions of the World Hazardous Waste Programme. Carcinogenic substances should not be disposed of from the laboratories directly through drains or by evaporation into the atmosphere, nor should they be buried since they might be released later. Carcinogenic substances should be treated strictly as per the protocol and the degraded products should be non-toxic and non-carcinogenic in nature. Procedures involved in treatment and disposal do not result in exposure to the personnel in charge of the work and the procedures on treatment and disposal do not end with contamination of equipment or workplace. The campus has a certain protocol to dispose of waste as well as expiry chemicals properly. As mentioned earlier, most of the waste materials were disposed of through corporation facilities. Napkins are incinerated onsite while agricultural wastes are recycled within the campus. Hazardous chemical waste is not used in the campus and also not applicable.

1.11 Recycling of Wastewaters

Wastewater recyclers are important features in any Organization. Once for all the implementations should follow the proper guidelines for wastewater treatment system discharge standards as per Central Pollution Control Board (CPCB). The main feature of these discharge standards is the treated water should not be harmful to the biodiversity, resources and the environment. If an industry or Organization has the wastewater treatment plan, proper records on the analysis of water input and output parameters including the running time of the wastewater treatment plant; its operation cost, its maintenance and the reuse records of the treated water should be well accounted for. A typical wastewater treatment system should be based on the waste characterization and the treatment of wastes which can be modified so as to fit into the motto of treating the wastewater which in turn releases safe water. Rain water harvesting is implemented in our campus to collect and to recycle water to promote self-sufficiency and sustainability which is used for toilets. Wastewater treatment plant is installed in the campus and functioning well at the time of onsite audit. Treated water has been recycled for gardening / vehicle wash purposes within the campus.

1.12 Napkin Disposal Facility

Menstrual hygiene management (MHM) is an indispensable part of the Swachh Bharath Mission Guidelines (SBM-G) for adolescent girls and ladies. As in step with MHM hints, 'Safe disposal' method making sure that the process of destruction of used and dirty materials is performed without human touch and with minimum environmental pollutants and 'unsafe disposal' method throwing used material into ponds, rivers or inside the fields exposes others inside the vicinity to decaying material and must be averted. Some of the unsafe practices of napkins include throwing them unwrapped into fields and rooftops, wrapping them in paper/ plastic bags and throwing them outdoors or in dustbins, burying them for decomposting, throwing them in latrine / toilets or burning it. These unsafe practices are to be avoided and rather health practices can be adopted. The campus Management is implementing the safe practices of disposing of napkins using small scale incinerators in ladies' hostels. Incinerator's facility and disposal structures in the proper directions and other social stigmas connected to menstruation influences the sanitary waste disposal conduct of women within the campus is very much appreciated.

The Organization is taking care of adolescent girls and women significantly in their personal hygiene. The management has installed napkin incinerators, wherever it is required.



Napkin Incinerator Facility in the Girls' Rest room

1.13 Compliances

- 1.13.1 It is observed that the Organization has created massive facilities for solid waste management and wastewater treatment to purify the wastewaters using activated- sludge to manage both solid wastes and wastewaters effectively without harming the environment.
- 1.13.2 The dust bins and eco-friendly trash are kept in different places across the campus to provide a dust free atmosphere to the stakeholders which are labelled properly for the indication of degradable and non-degradable items.
- 1.13.3 Swachh Bharath Abhiyan and National service schemes are implemented effectively towards sanitation, solid waste management and refining drinking water quality to promote cleanliness.
- 1.13.4 'Environ Club' along with NSS Units are functioning well and conducting a large number of awareness programmes related to nature conservation and environmental protection.

1.14 Endorsements for Further Improvements

A proper step may be taken to minimize the environmental degradation by means of developing 'Sanitation and hygiene policy' and 'Waste management policy' in collaboration with Governmental and Non-Governmental Organizations.

- 1.14.1 Helpline numbers for waste collection may be made available in the Campus which may be useful for door-to-door collection of wastes.
- 1.14.2 The concept of eco-friendly culture and sensitizing students to minimize the use of plastics, non-biodegradable materials and exploitation of natural resources which pose environmental hazards may be carried out.
- 1.14.3 Waste disposal management for both dry and wet wastes should be proper in which from collection to disposal of the waste, together with monitoring and regulation of the same may be undertaken.

- 1.14.4 Policy on paper usage may be initiated with certain guidelines to reduce the usage of papers.
- 1.14.5 Attempts may be made to segregate the wastes and to convert organic wastes into fertilizing material through recycling and composting processes which may be used for vegetation purposes.
- 1.14.6 Students may be taken to some industrial areas including the waste management sites to teach about the recycling of wastewaters, solid wastes, natural ecosystems, pollution-free environment and environmental education.

1.15 Conclusion

The Organisation is a well- established College and efforts are continuously made in providing an eco-friendly atmosphere to the stakeholders. The environmental protection initiatives are substantial by means of creating solid waste management, wastewater treatment and sanitation without harming the environment. Campus has 'solid waste management and wastewater treatment facility to recycle the solid wastes and wastewaters, respectively. Swachh Bharath Abhiyan is implemented effectively by the campus to promote sanitation and cleanliness. Waste management audit is carried out to provide an indication to the management how the hygiene system is performing.

Certificates of Nature Science Foundation Coimbatore, Tamil Nadu.

- 1. ISO Certificate (QMS 9001:2015)
- 2. ISO Certificate (EMS 14001:2015)
- 3. ISO Certificate (OHSMS 45001:2018)
- 4. ISO Certificate (EnMS 50001:2018)
- 5. MSME Certificate





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QCS MANAGEMENT PVT. LTD. MANAGEMENT SYSTEMS CERTIFICATION Certificate of Registration
ISO 45001:2018 (Occupational Health & Safety Management System)
ADDRESS: NO. 2669, LIG-II, GANDHI MANAGAR PEELAMEDU COIMBATORE - 641 004 TAMIL NADU, INDIA. Scope of Certification: PROVIDING TRAINING AND AUDITING SERVICES IN THE FIELD OF GREEN CAMPUS, ENVIRONMENT, ENERGY, OCCUPATIONAL HEALTH AND SAFETY, HYGIENE AND WASTE MANAGEMENT AT EDUCATIONAL INSTITUTES AND INDUSTRIAL SECTOR.
Certificate Number : QCS/EUAS/OHS/002 Issue Date : 03/08/2022 Expiration Date : 02/07/2023 Certificate Number : QCS/EUAS/OHS/002 : 02/07/2023 Issue Date : 02/07/2024 Expiration Date : 02/08/2023
Partha Bagchi (Managing Director)
Validity of this Certificate is subject to Surveillance Audits to be conducted before scheduled due dates of surveillance audits as mentioned on the certificate, failing which the certificate will stand to be withdrawn and need to be treated as an initial certification process to reactivate its continuity on the register of EUAS and QCS. This Certificate is valid when confirmed by data listed on the (Euro Universal Accreditation Systems) EUAS" <u>www.euas.acc.org</u> . The authenticity & validity of this certificate may be re-affirmed by referring to our company website - <u>www.qcspl.com</u> . Lack of fulfillment of conditions as set out on the 'Certification Contract' (Annex 13) may render this certificate invalid. Any alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of Iaw. This certificate remains the property of QCS and to be returned on request.
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Certificate of Registration

This is to certify that

NATURE SCIENCE FOUNDATION

LIG II, GANDHIMAA NAGAR, PEELAMEDU, COIMBATORE - 641 004, TAMILNADU, INDIA.

has been independently assessed by QRO

and is compliant with the requirement of:

ISO 50001:2018

Energy Management Systems

For the following scope of activities:

PROVIDING CONSULTANCY SERVICES FOR ENVIRONMENT, ENERGY, GREEN, HYGIENE, SOIL AND WATER, WASTE MANAGEMENT, BIOMEDICAL WASTE MANAGEMENT, E-WASTE MANAGEMENT, PLASTIC WASTE MANAGEMENT AND ACADEMIC AND ADMINISTRATIVE AUDITS TO EDUCATIONAL INSTITUTIONS AND INDUSTRIAL SECTORS AS PER THE OWN CHECKLISTS, START UP THE INTERNATIONAL ECO CLUB STUDENTS CHAPTER, OFFERING LEAD AUDITOR COURSE ON ENERGY AND ENVIRONMENT, AWARDS TO MERITORIOUS CANDIDATES.

Date of Certification: 9th August 2022 1st Surveillance Audit Due: 8th August 2023 2nd Surveillance Audit Due: 8th August 2024 Certificate Expiry: 8th August 2025

Certificate Number: 305022080903EN









Head of Certification

Validity of this certificate is subject to annual surveillance audits to be done successfully on or before 365 days from date of the audit. (In case surveillance audit is not allowed to be conducted: this certificate shall be suspended / withdrawn). The Validity of this certificate can be verified at www.qrocert.org This certificate of registration remains the property of QRO Certification LLP, and shall be returned immediately upon request.

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8. Certificates of Lead Auditors

- 1. Bureau of Energy Efficiency (BEE), LEED AP and GRIHA Certificates of Er. D. Dineshkumar, Energy and Environment Auditor of NSF.
- 2. Indian Green Building Council (IGBC AP) Accredited Professional of Dr. B. Mythili Gnanamangai, Vice-Chairman of NSF.
- 3. Tamil Nadu Fire and Rescue Service Certificate of Er. S. Srinivash, Energy Auditors of NSF.
- 4. Energy Management System ISO 50001:2018 Certificate of Dr. D. Vinoth Kumar, Joint Director of NSF.
- 5. ISO 17020:2012 certificate of Ms. V. Sri Santhya, Assistant Director of NSF.



BUREAU OF ENERGY EFFICIENCY

Examination Registration No. : EA-14056 Serial Number 9176

Certificate Registration No. : 9176



Certificate For Certified Energy Manager

This is to certify that Mr./Mrs./Ms. Dinesh Kumar D Son/Daughter of Mr./Mrs. R M Dhanasekaran who has passed the National Examination for certification of energy manager held in the month of October 2011 is qualified as certified energy manager subject to the provisions of Bureau of Energy Efficiency (Certification Procedures for Energy Managers) Regulations, 2010.

This certificate shall be valid for five years with effect from the date of award of this certificate and shall be renewable subject to attending the prescribed refresher training course once in every five years.

His /Her name has been entered in the Register of certified energy manager at Serial Number .9176 being maintained by the Bureau of Energy Efficiency under the aforesaid regulations.

Mr./Mrs./Ms. Dinesh Kumar D is deemed to have qualified for appointment or designation as energy manager under clause (/) of Section 14 of the Energy Conservation Act, 2001 (Act No.52 of 2001).

Digitally Signed: RAKESH KUMAR RAI Sun Mar 01 10:58:55 IST 2020 Secretary, BEE New Delhi Secretary Bureau of Energy Efficiency New Delhi

Dates of attending the refresher course	Secretary's Signature	Dates of attending the refresher course	Secretary's Signature
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Certificate of Successful Attainment

This is to certify that

DR. D. VINOTH KUMAR

HAS SUCCESSFULLY COMPLETED THE FIVE DAYS (40 HOURS)

LEAD AUDITOR COURSE

BY PASSING THE WRITTEN EXAMINATION BASED ON

ISO 50001:2018

ENERGY MANAGEMENT SYSTEMS

Examination Date: 15/07/2022 Certificate issue Date: 22/07/2022 Certificate registration number: QCS/TR/C/0056 Total Course duration: 40 hours CPD Credits Earned: 32

Remarks: Roughly one hour of study time equals to 1 CPD Credit.

This certificate can be validated online from the industry wide Global Professional Register at www.qcspl.com.

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Partha Bagchi (Managing Director)

NATURE SCIENCE FOUNDATION

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Certificate of Best Green Campus Award



NSF/BGCA/MTNC/2022/43

This is to certify that Mannar Thirumalai Naicker College, Madurai – 625 004, Tamil Nadu has been honoured with "Best Green Campus Award" for maintaining the campus as per the "Green and Energy Conservation Building Code". The Organization imparts the thrust of innovating new ideas to accomplish eco-friendly environment to the stakeholders. Energy and Environment Management Audits such as 'Green Campus Audit', 'Environment Audit' and 'Energy Audit' were carried out on 24th August 2022.

This Certificate is valid till 25th August 2025. Ref. No: ISO/NSF/SER/R/43

(Dr. S. RAJALAKSHMI JAYASEELAN) Chairman of NSF

Certified ISO QMS, EMS, EnMS, OHMSMS

Read, No. 114/2017

Ministry of MSME. Govt. of India

سركبز الإمبارات النعبالنمني للاعتبضاد Emirates International Accreditation Cente

(Mr. BSC. NAVEEN KUMAR) Faculty, Mahatma Gandhi National Council for Rural Education Ministry of Higher Education, New Delhi.

(Dr. B. MYTHILI GNANAMANGAI) Certified Auditor IGBC AP & ASSOCHAM Indian Green Building Council



(Er. D. DINESH KUMAR) BEE Certified Energy Auditor Bureau of Energy Efficiency